

549, 396

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
30 September 2004 (30.09.2004)

PCT

(10) International Publication Number  
**WO 2004/082798 A1**

(51) International Patent Classification<sup>7</sup>: **B01D 11/04**,  
C22B 3/02 // 15:00, 19:00, 23:00, 34:34, 60:02

(21) International Application Number:  
PCT/FI2004/000136

(22) International Filing Date: 11 March 2004 (11.03.2004)

(25) Filing Language: Finnish

(26) Publication Language: English

(30) Priority Data:  
20030411 19 March 2003 (19.03.2003) FI

(71) Applicant (for all designated States except US): **OUTOKUMPU OYJ** [FI/FI]; Riihitontuntie 7, FI-02200 Espoo (FI).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **NYMAN, Bror** [FI/FI]; Ruispolku 1, FI-28450 Ulvila (FI). **EKMAN, Eero** [FI/FI]; Itälinjakatu 7 A 1, FI-28100 Pori (FI). **HULTHOLM, Stig-Erik** [FI/FI]; Sitomatie 1, FI-28360 Pori (FI). **PEKKALA, Pertti** [FI/FI]; Vehaksentie 45 B,

FI-02300 Espoo (FI). **LYYRA, Juhani** [FI/FI]; Kalastajankatu 1 E, FI-02230 Espoo (FI). **LILJA, Launo** [FI/FI]; Liisankatu 19 A, FI-28100 Pori (FI). **KUUSISTO, Raimo** [FI/FI]; Kalastajankatu 1 E, FI-02230 Espoo (FI).

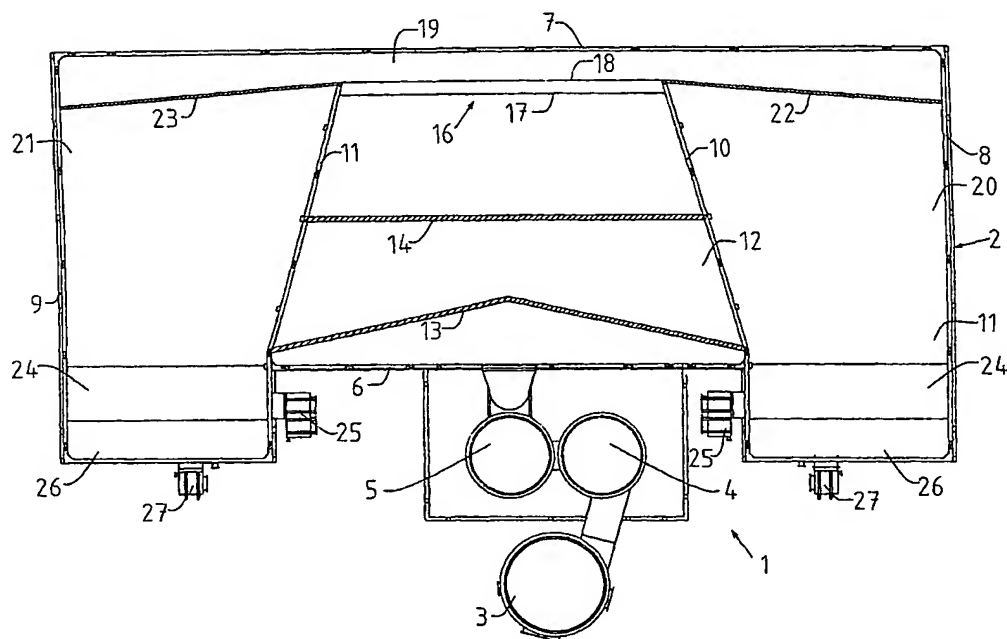
(74) Agent: **OUTOKUMPU OYJ**; Intellectual Property Management, P.O. Box 27, FI-02201 Espoo (FI).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NT, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK,

[Continued on next page]

(54) Title: METHOD AND EQUIPMENT FOR LIQUID-LIQUID EXTRACTION



(57) Abstract: The invention relates to a method for reversing the dispersion formed in the mixing section of liquid-liquid extraction and kept condensed in the separation section and the separated solutions from the rear end of the separation section to flow back towards the feed end of the separation section as two separate streams. The invention also refers to the extraction equipment for implementing the reversed flow.

WO 2004/082798 A1



TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Declarations under Rule 4.17:**

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations* AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, *ARIPO patent* (BW, GH, GM, KE, LS, MW, MZ, SD,

*SL, SZ, TZ, UG, ZM, ZW), Eurasian patent* (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), *European patent* (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), *OAPI patent* (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

- *of inventorship (Rule 4.17(iv)) for US only*

**Published:**

- *with international search report*

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*